

CLAIMS:

1. A polishing composition used in polishing a wafer edge, the polishing composition comprising:

5 silicon dioxide, wherein an average primary particle diameter D_{SA} of the silicon dioxide, which is obtained from a specific surface area of the silicon dioxide measured by a BET method, is at least 40 nm, wherein a 95th percentile diameter D_{95} of the silicon dioxide is a diameter of a particle of the
10 silicon dioxide below which 95% (by volume) of all particles contained in the silicon dioxide are smaller, wherein a 5th percentile diameter D_5 of the silicon dioxide is a diameter of a particle of the silicon dioxide below which 5% (by volume) of all particles contained in the silicon dioxide are smaller,
15 and wherein a ratio D_{95}/D_5 of the silicon dioxide, which is obtained by dividing the 95th percentile diameter D_{95} by the 5th percentile diameter D_5 , is no more than 3.8,
an alkaline compound,
a water-soluble polymer, and
20 water.

2. The polishing composition according to claim 1, wherein the average primary particle diameter D_{SA} is at least 60 nm.

25 3. The polishing composition according to claim 2, wherein the average primary particle diameter D_{SA} is at least 70 nm.

4. The polishing composition according to claim 1, wherein the ratio D_{95}/D_5 is no more than 3.6.
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5. The polishing composition according to claim 4, wherein the ratio D_{95}/D_5 is no more than 3.4.

6. The polishing composition according to claim 1, wherein
35 the silicon dioxide is at least one silica selected from

colloidal silica, fumed silica, and precipitated silica.

7. The polishing composition according to claim 6, wherein the silicon dioxide is colloidal silica.

8. The polishing composition according to claim 1, wherein the water-soluble polymer is at least one polymer selected from hydroxyethyl cellulose, polyvinyl alcohol, polyethylene oxide, and polyethylene glycol.

9. The polishing composition according to claim 8, wherein the water-soluble polymer is hydroxyethyl cellulose.

10. The polishing composition according to claim 1, wherein content of the water-soluble polymer in the polishing composition is from 0.0001 to 0.5 wt%.

11. The polishing composition according to claim 1, wherein the alkaline compound is at least one alkaline compound selected from potassium hydroxide, sodium hydroxide, potassium hydrogencarbonate, potassium carbonate, sodium hydrogencarbonate, sodium carbonate, tetramethylammonium hydroxide, ammonium hydrogencarbonate, ammonium carbonate, anhydrous piperazine, and piperazine hexahydrate.

12. A polishing composition used in polishing a wafer edge, the polishing composition comprising:

silicon dioxide, wherein an average primary particle diameter D_{SA} of the silicon dioxide, which is obtained from a specific surface area of the silicon dioxide measured by a BET method, is at least 40 nm, wherein a 95th percentile diameter D_{95} of the silicon dioxide is a diameter of a particle of the silicon dioxide below which 95% (by volume) of all particles contained in the silicon dioxide are smaller, wherein a 5th percentile diameter D_5 of the silicon dioxide is a diameter of

a particle of the silicon dioxide below which 5% (by volume) of all particles contained in the silicon dioxide are smaller, and wherein a value $D_{95}/D_5/D_{SA}$ of the silicon dioxide, which is obtained by dividing the 95th percentile diameter D_{95} by the

5 5th percentile diameter D_5 and further dividing the obtained ratio D_{95}/D_5 by the average primary particle diameter D_{SA} , is no more than 0.07,

an alkaline compound,
a water-soluble polymer, and

10 water.

13. The polishing composition according to claim 12, wherein the value $D_{95}/D_5/D_{SA}$ is no more than 0.06.

15 14. The polishing composition according to claim 13, wherein the value $D_{95}/D_5/D_{SA}$ is no more than 0.045.

15. The polishing composition according to claim 12, wherein the ratio D_{95}/D_5 is no more than 3.8.

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16. The polishing composition according to claim 15, wherein the ratio D_{95}/D_5 is no more than 3.6.

17. The polishing composition according to claim 16, wherein

25 the ratio D_{95}/D_5 is no more than 3.4.

18. A method of polishing a wafer, the method comprising:
preparing a polishing composition, wherein the polishing composition includes:

30 silicon dioxide, wherein an average primary particle diameter D_{SA} of the silicon dioxide, which is obtained from a specific surface area of the silicon dioxide measured by a BET method; is at least 40 nm, wherein a 95th percentile diameter D_{95} of the silicon dioxide is a

35 diameter of a particle of the silicon dioxide below which

95% (by volume) of all particles contained in the silicon dioxide are smaller, wherein a 5th percentile diameter D_5 of the silicon dioxide is a diameter of a particle of the silicon dioxide below which 5% (by volume) of all
5 particles contained in the silicon dioxide are smaller, and wherein a ratio D_{95}/D_5 of the silicon dioxide, which is obtained by dividing the 95th percentile diameter D_{95} by the 5th percentile diameter D_5 , is no more than 3.8;

an alkaline compound;
10 a water-soluble polymer; and
water; and

polishing a edge of the wafer using the polishing composition.

15 19. A method of polishing a wafer, the method comprising:
preparing a polishing composition, wherein the polishing composition includes:

silicon dioxide, wherein an average primary particle diameter D_{SA} of the silicon dioxide, which is obtained
20 from a specific surface area of the silicon dioxide measured by a BET method, is at least 40 nm, wherein a 95th percentile diameter D_{95} of the silicon dioxide is a diameter of a particle of the silicon dioxide below which 95% (by volume) of all particles contained in the silicon
25 dioxide are smaller, wherein a 5th percentile diameter D_5 of the silicon dioxide is a diameter of a particle of the silicon dioxide below which 5% (by volume) of all particles contained in the silicon dioxide are smaller, and wherein a value $D_{95}/D_5/D_{SA}$ of the silicon dioxide,
30 which is obtained by dividing the 95th percentile diameter D_{95} by the 5th percentile diameter D_5 and further dividing the obtained ratio D_{95}/D_5 by the average primary particle diameter D_{SA} , is no more than 0.07;

an alkaline compound;
35 a water-soluble polymer; and

water; and
polishing a edge of the wafer using the polishing
composition.

- 5 20. A method of polishing a wafer, the method comprising:
preparing a polishing composition, wherein the polishing
composition includes:

silicon dioxide, wherein an average primary particle
diameter D_{SA} of the silicon dioxide, which is obtained
10 from a specific surface area of the silicon dioxide
measured by a BET method, is at least 40 nm, wherein a
95th percentile diameter D_{95} of the silicon dioxide is a
diameter of a particle of the silicon dioxide below which
95% (by volume) of all particles contained in the silicon
15 dioxide are smaller, wherein a 5th percentile diameter D_5
of the silicon dioxide is a diameter of a particle of the
silicon dioxide below which 5% (by volume) of all
particles contained in the silicon dioxide are smaller,
wherein a ratio D_{95}/D_5 of the silicon dioxide, which is
20 obtained by dividing the 95th percentile diameter D_{95} by
the 5th percentile diameter D_5 , is no more than 3.8, and
wherein a value $D_{95}/D_5/D_{SA}$ of the silicon dioxide, which
is obtained by dividing the ratio D_{95}/D_5 by the average
primary particle diameter D_{SA} , is no more than 0.07;
25 an alkaline compound;
a water-soluble polymer; and
water; and

polishing a edge of the wafer using the polishing
composition.

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